REMARKS/ARGUMENTS

In reply to the Office Action mailed January 30, 2004, applicants respectfully request reconsideration and allowance of all the claims pending in the subject application. In the Office Action, the Examiner issued a double patenting rejection of claims 8, 9, 13, 16 and 19, rejected claims 1-7 for indefiniteness and rejected all the claims pending in the subject application for obviousness. In reply, applicants have submitted a terminal disclaimer and amended claims 1, 8 and 16 of the subject application. Accordingly, claims 1-20 remain pending in the subject application.

In the Office Action, the Examiner issued a provisional obvious-type double patenting rejection of claims 8, 9, 13, 16 and 19 over claim 17 of applicants' copending application 09/925,275. In reply to the provisional obviousness-type double patenting rejection, applicants respectfully submit a terminal disclaimer disclaiming the terminal portion of the term of the patent issuing from this application that is beyond the term of a patent issuing from the copending application. Applicants respectfully submit that the terminal disclaimer overcomes the double patenting rejection.

The Office Action indicates that claims 1-7 were rejected under 35 U.S.C. §112, second paragraph, for indefiniteness because claim 1 recites "the catalyst particle concentration" in line 6 and "the gaseous fluids concentration" in line 7 without sufficient antecedent basis. Applicants have amended claim 1 to correct this by replacing the term "the" with the term "a" in the two above quoted clauses in claim 1. Applicants respectfully submit that the rejections for indefiniteness of claims 1-7 are now overcome.

The Office Action rejected claims 1-20 under 35 U.S.C.§ 103(a) as being obvious over U.S. Patent 5,565,020 (the "Niewiedzial patent") in view of U.S. Patent 2,039,692 (the "Van Tongeren patent"). Applicants have amended claims 1, 8 and 16 to indicate that the mixture of catalyst and gaseous fluids that are induced to swirl in a first angular direction then must travel through a conduit before entering a cyclone which induces the gaseous fluids and catalyst to swirl in a counter angular direction. This can be seen in Figure 1 as the mixture of gaseous fluids and catalyst in the reaction conduit 12 exit from discharge opening 16 of swirl arm 14 into separation vessel 11. The tangential discharge of gases and catalyst from discharge opening 16 produces a swirling helical motion in a first angular direction about the interior of separation vessel 11. The mixture less some of the catalyst then enters the gas recovery conduit 18. The gas recovery conduit 18 delivers the mixture of gaseous fluids and catalyst to the cyclones 22, which induce the mixture to swirl in the angular direction that is counter to the first angular direction. However, what was not known in the prior art and is certainly not contemplated by the Niewiedzial patent is that the swirling mixture continues to swirl after it leaves the separation vessel 11 and as the mixture ascends through the gas recovery conduit 18. The research that led up to this invention determined that the swirling in the separation vessel 11 that is induced upon the mixture leaving the reaction conduit 12 continues up through the gas recovery conduit 18. Therefore, this key knowledge, up until filing unknown, laid the foundation of the invention of swirling the mixture in a countercurrent direction in the cyclone 22. The prior

art of fluid catalytic cracking (FCC) did not know that the mixture of gaseous fluids and catalyst continues to swirl during ascension through the gas recovery conduit. Indeed, the arrangement disclosed in the Niewiedzial patent would have even less likelihood of continuing the swirl induced by discharge out of discharge openings 44 when it ascends through the gas recovery conduit 52. The inlet to the gas recovery conduit 54 is disposed below discharge opening 44. Consequently, gas discharged from discharge opening 44 that ascends upwardly, which is what hot gas typically does, would have to reverse direction and descend below discharge opening 44 before entering annular inlet to the gas recovery conduit 52. This reversal of direction would have been thought to even further disrupt any swirling induced in separation vessel 42 before entering gas recovery conduit 52.

Applicants respectfully submit that because there is no teaching in the prior art that a mixture of gaseous fluids and catalyst ascending up the gas recovery conduit 52 continues to swirl in the same direction as the mixture discharged from the discharge opening 44, there would be no motivation to combine the teachings of the Niewiedzial patent with the teachings of the Van Tongeren patent. The Van Tongeren patent was skimming dust from one swirling mixture of dust and gas into an adjacent cyclone 48. However, since there is no knowledge in the art that the mixture of gases and fluids were swirling in a gas recovery conduit 52 of the Niewiedzial patent, there would have been no motivation to combine the teachings of the Van Tongeren patent with the teachings of the Niewiedzial patent. Applicants have amended the independent claims in the subject application to make it clear that a mixture of gaseous fluids and catalyst travels through an intervening gas recovery conduit in its transition from the first swirling direction upon exit from the reaction conduit to the countercurrent flow direction in this cyclone.

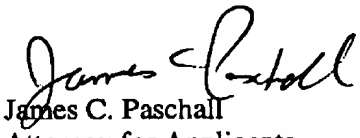
Applicants respectfully request reconsideration and withdrawal of the rejection of claims 1-20 based on the teachings of the Niewiedzial patent and the Van Tongeren patent.

The Office Action also rejected claims 1-20 for being obvious over the Niewiedzial patent in view of U.S. Patent 4,634,456 (the "Syred patent"). Similar to the prior rejection for obviousness based on the Van Tongeren patent, applicants respectfully submit that there is no motivation to combine the teachings of the Syred patent with the teachings of the Niewiedzial patent again because there is no teaching in the art that the mixture of gaseous fluids and catalyst continue to swirl as it ascends up the gas recovery conduit. Moreover, motivation to combine the teachings of the Syred patent with those of the Niewiedzial patent is lacking for the rejection cites the motivation to combine teachings is that the Syred patent teaches that the countercurrent swirling direction in the secondary chamber improves grading of the dust particles by size. Office Action at 6. This implies that much of the dust particles are excluded from the secondary chamber and not recovered. However, in the FCC context, it is desired to collect all of the catalyst particles in the gaseous fluids mixture, not to purposefully reject a portion of the catalyst in the mixture. Hence, the cited motivation would be insufficient to import the dust grading teachings of the Syred patent into the FCC art of the Niewiedzial patent if catalyst recovery is suggested to be poor. Accordingly, applicants respectfully request reconsideration and

withdrawal of the rejection of claims 1-20 for obviousness over the Niewiedzial patent in view of the Syred patent.

Applicants respectfully request reconsideration and allowance of all the claims 1-20 pending in the subject application. Should the Examiner have any questions regarding this matter please feel free to contact the undersigned.

Respectfully submitted,



James C. Paschall
Attorney for Applicants
Reg. No. 36,887
(847) 391-2355 (phone)
(847) 391-2387 (fax)

James W. Hellwege
Registration No. 28,808
Washington Counsel (703) 205-8021

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